
STORMWATER INNOVATION CENTER



2023

ANNUAL REPORT



Stormwater
Innovation
Center

www.stormwaterinnovationcenter.org
www.facebook.com/stormwaterinnovation

The Stormwater Innovation Center (SIC) conducts research, develops trainings and outreach on stormwater best practices focusing especially on green infrastructure. Created in 2020 as a collaboration between the Audubon Society of Rhode Island, the City of Providence Parks Department and The Nature Conservancy of Rhode Island, SIC has had a productive and very successful year.

WHO WE ARE

Green infrastructure research, training, outreach and implementation

Roger Williams Park hosts the Stormwater Innovation Center (SIC), and the collaboration has grown to include the City of Providence Public Works Department, the University of Rhode Island's Coastal Institute, Restore America's Estuaries, Rhode Island Department of Transportation, the SNEP Network, the Narragansett Bay Estuary Program, the University of New Hampshire Stormwater Center, Rhode Island School of Design, the Roger Williams Park Conservancy, Save the Bay, and the Green Infrastructure Coalition.

The Stormwater Innovation Center shares effective strategies and valuable insights about stormwater management and green infrastructure with municipalities, non-profits, and stormwater professionals throughout Rhode Island and Southeast New England. A wide range of green infrastructure has already been implemented in Roger Williams Park to reduce stormwater contaminants from entering the ponds and degrading water quality. The SIC monitors and researches these green infrastructure systems and their receiving water bodies to better understand their performance, function, and maintenance needs.

In 2023, SIC expanded research and monitoring developed in Roger Williams Park to green infrastructure systems throughout Rhode Island.

To build regional expertise in stormwater management, we organize place-based professional trainings and workshops for planners, engineers, landscape architects, contractors, and maintenance staff, fostering a community of knowledge sharing and networking. Our ongoing collaboration with municipalities and organizations across the region aims to expand the implementation of effective green infrastructure and improve water quality.

Highlighting the green infrastructure in the park and informing the community about stormwater is essential to our mission. Through public outreach events, tours, community science programs, innovative signage and materials, and school programming, we aim to raise awareness and appreciation for sustainable stormwater practices, creating a positive environmental impact.

LEADERSHIP TEAM

ADVISORY COMMITTEE

The Stormwater Innovation Center Leadership Team meets weekly to provide practical input and ideas that drive our mission and objectives. The team actively contributes to ongoing and future projects, spanning research, training, community outreach and stormwater management implementation. The team collaborates on grant applications and pursues funding opportunities, ensuring an efficient and effective approach to securing financial support. Through this collaborative effort, the Advisory Team significantly influences the Center's direction and success.

Leadership Team Members

Byrnes, Brian, Providence Parks Department
Freitas, Lee Ann, Providence Parks Department
Ferguson, Wenley, Save The Bay
Kinney, Heather, The Nature Conservancy of Rhode Island
Kopp, Ryan, Stormwater Innovation Center, Audubon Society of Rhode Island
Kellogg, Q, University of Rhode Island
Kerr, Meg, Retired Advisor and Consultant
Ramirez, Jose, Roger Williams Park Conservancy
Reeves, Rebecca, Stormwater Innovation Center, Audubon Society of Rhode Island
Tuoni, Angela, The Nature Conservancy of Rhode Island

The Advisory Committee at the Stormwater Innovation Center is important in fostering collaboration and knowledge exchange within the stormwater management and water quality restoration community. Through our quarterly [meetings](#), we keep partners informed about ongoing projects and programs. These sessions provide a platform for presenters to share their expertise, insights, and experiences on various projects. The Advisory Committee actively encourages networking among stormwater professionals. Our goal is to cultivate an inclusive environment that promotes meaningful discussions, shared learning, and the advancement of stormwater solutions and practices.

Advisory Committee Members

Alix, April - Providence Parks Urban Wildlife Refuge Partnership
Avenia, Greg - Kleinfelder
Baker, Joe - Rhode Island Department of Transportation
Barthmaier-Payne, Johanna - Rhode Island School of Design
Blair, Sam - Woonasquatucket River Watershed Council
Byrnes, Brian - City of Providence Parks Department
Caldwell, Dave - Caldwell & Johnson
Chopy, Jillian - Rhode Island Department of Health
Churgin, Sara - Eastern Rhode Island Conservation District
Cortes, Andrew - Building Futures
Cullings, Ian - City of Providence Department of Public Works
De La Cruz, Priscilla - City of Providence Sustainability Department
Dill, Chris - Rhode Island Department of Environmental Management
Dormody, Sheila - City of Providence Policy and Resiliency
Ewald, Holly - Artist and Educator
Ferguson, Wenley - Save the Bay
Freitas, Lee Ann - City of Providence Botanical Center
Gold, Art - Retired, University of Rhode Island Coastal Institute
Haberek, Joe - Rhode Island Department of Environmental Management
Hamilton, Heather - Rhode Island Department of Transportation
Hill, Lance - Pare Corporation
Hochman, Craig - City of Providence Department of Public Works
Houle, Jamie - University of New Hampshire
Hussain, Rafeed - The Nature Conservancy
Kellogg, Q - University of Rhode Island Coastal Institute
Kerr, Meg - Retired, Audubon Society of Rhode Island
Kinney, Heather - The Nature Conservancy
Korioth, Kim - Rhode Island Infrastructure Bank
Kuchar, Brian - Horsley Witten
Lafaille, Brian - Rhode Island Department of Environmental Management
Le, Todd - Northern Rhode Island Conservation District
Lehrer, Alicia - Woonasquatucket River Watershed Council
Nickerson, Bonnie - Roger Williams Park Conservancy
Parrett, Jill - Providence College Facilities/Sustainability
Proft, Kevin - City of Providence Sustainability Department
Ramirez, Jose - Roger Williams Park Conservancy
Richardson, Alisa - Rhode Island Department of Transportation
Scott, Elizabeth - SNEP Network
Shea, Chris - DiPrete Engineering
Silversmith, Jeanine - Rhode Island Environmental Education Association
Stoops, Renee - Southern Rhode Island Conservation District
Tally, Edward - City of Cranston
Thorp, Jed - Clean Water Action
Tuoni, Angela - The Nature Conservancy
Venturini, Kate - University of Rhode Island Cooperative Extension
Wentzell, Nick - Rhode Island Department of Transportation

OUR TEAM

Working together to achieve our shared goals

Rebecca Reeves and Ryan Kopp served as the full-time staff at the Stormwater Innovation Center in 2023, with seasonal support from Brown University summer intern Yuna Sato. We collaborated with SIC partners for contract work with Bruce Hooke Consulting, The Nature Conservancy of Rhode Island, UNH Stormwater Center, Meg Kerr Consulting, Atomic Clock, Hannah Riley Consulting, Steer Forward Media, Rain Snap Paid Volunteers, Stormwater in School Program Teaching Artists, Rain Harvest Festival Performing Artists and Educators, Kleinfelder, and URI Watershed Watch.



In-kind match and staff time on collaborative projects was also provided by Providence Parks Department, City of Providence Public Works Department, University of Rhode Island Coastal Institute, Rhode Island School of Design, Audubon Society of Rhode Island, Institute at Brown University for Environment and Society, Woonasquatucket River Watershed Council, Southern Rhode Island Conservation District, Pare Engineering, Salve Regina, Roger Williams Park Conservancy, The Nature Conservancy of Rhode Island, the Pond and Lake Connection, the Roger Williams Park Conservancy, Providence Parks Urban Wildlife Partnership, the Green Infrastructure Coalition, 15-Minute Field Trips, the Horsley Witten Group, Kleinfelder, and the Narragansett Bay Research Reserve.

MONITORING

Green Infrastructure, Rain Snap, Cyanobacteria and Water Quality

GREEN INFRASTRUCTURE MONITORING

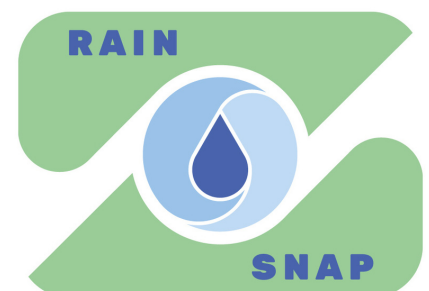
This year we completed our NBEP funded project that monitored 25 green infrastructure sites around Rhode Island. The primary project objective was to identify design features, construction practices, and maintenance protocols that contribute to sustained functionality in green infrastructure sites. Recognizing the importance of continuous assessment, the project emphasized the need for ongoing evaluation to ensure long-term water quality improvement. The project implemented water level loggers, precipitation gauges, and remote field cameras in and around existing green infrastructure sites for a cost-effective method to assess the performance of a system. Our goal is to see improving designs, maintenance and construction methods, and retrofitting of underperforming projects, with the ultimate goal of improving water quality across the region.



Our interactive [FINAL REPORT](#) includes collected data, charts, design plans, videos, methods used and analysis. The project reinforced the SIC's findings that many green infrastructure projects do not perform as designed and showcased the importance of monitoring green infrastructure projects after they are installed. Out of the 26 sites monitored, 12 were found to be operating at full capacity and receiving stormwater flows, 10 sites received stormwater flows but were operating at less than their maximum capacity, and 4 sites showed no evidence of receiving stormwater flows or ponding water during qualifying rain events.

RAIN SNAP

In another effort to promote long-term inspection, monitoring and assessment of green infrastructure after implementation, in 2023 we launched [Rain Snap](#), a community science stormwater monitoring program. The development of the Rain Snap website and its content was a collaborative endeavor. Bruce Hooke spearheaded the website design, Atomic Clock handled the creation of instructional and keynote videos for the site, and Hannah Riley contributed her design expertise to craft the new Rain Snap logo.

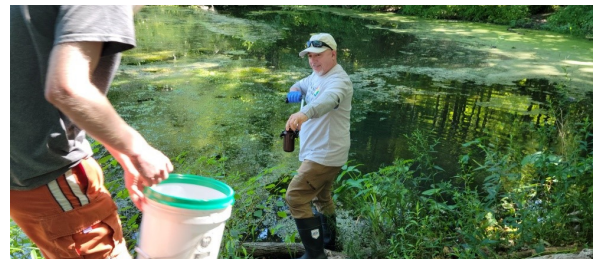




There are currently 24 green infrastructure sites on the platform. Volunteers make site visits during storm events, document site conditions with smartphone videos and photos, and field notes, then upload them to the website. These [videos](#) and data provide essential information for municipal decision makers, maintenance staff, and engineers and designers about the effectiveness of the site in treating stormwater and improving water quality. Nearly 200 videos were uploaded since the site officially launched in July 2023. RainSnap is funded through the Stormwater Innovation Center by a grant from EPA's Southeast New England Program (SNEP), through SNEP Watershed Implementation Grants managed by Restore America's Estuaries. Rain Snap was featured in an [article](#) written for the Brown Herald.

CYANOBACTERIA

Our collaborative efforts with the Nature Conservancy of Rhode Island (TNC) allowed us to increase our cyanobacteria monitoring and outreach program this year. A seasonal staff person, Roy Arezzo, was hired by TNC to coordinate sampling and outreach around Rhode Island. TNC and Audubon interns from the IBES program provided field and lab assistance. This program provided support to [Cyanobacteria Monitoring Collaborative](#), [EPA CyAn](#) and [RIDEM/RIDOH](#) cyanobacteria projects. We did bi-weekly visual assessments, microscopy, fluometry and toxin sampling at [22 sites](#) around Rhode Island from June – October. We tested field toxin [Abraxis test strips](#) and compared results versus RIDOH lab results to verify the effectiveness of the less expensive toxin sampling method. All data and information is uploaded in real-time to our cyanobacteria [DASHBOARD](#).



Community Science in ACTION!

YOU can make a difference...
There are several steps you can take to improve water quality and reduce the impact of harmful blooms.

On Land

- Do not feed wildlife
- Avoid littering
- Pick up your dog waste

On the Water:
If you see a bloom, report it and avoid contact with the water.

At Home and Work:

- Planting native plants and gardens
- Avoid use of fertilizers & pesticides
- Maintain your home's septic system
- Support local and federal laws that protect our water resources and climate resiliency.
- Seek out watershed councils in your area and get involved!

What we do: Check out the map of sites we are monitoring, scan below



Resource Page

To learn more about stormwater runoff solutions and cyanobacteria issues, visit the sites below:

- stormwaterinnovation.org
- cyanos.org
- rainsnap.org - sign up to help monitor green infrastructure!

Connect with the bloomWatch App!

You can participate by making observations in the field with your phone!

bloomWatch is an app developed by the Cyanobacteria Monitoring Collaborative. The info is used by local agencies to inform decision making and keep the public safe.

<https://cyanos.org/bloomwatch/>
OR
Scan below to download bloomWatch!



Improving Rhode Island's Water Resources for ALL



Join the Stormwater Innovation Center's efforts to protect local water bodies!



Outreach efforts included the creation of educational materials and brochures, partnership development, and community events and workshops. Roy delivered a [water quality workshop](#) at the Lincoln Woods Nature Center, was interviewed by the [Story Walking Podcast](#), tabled at [National Oyster Day at Narragansett Brewing](#), the [Roger Williams Park Gateway Center Neighbor Days](#), and at Audubon's Raptor Weekend among many other events. The [Fall Audubon Report](#) highlighted the collaborative cyanobacteria work being done.

WATER QUALITY

Seven dedicated [volunteers](#) received training, in partnership with URI Watershed Watch, and collected water quality samples in the [Roger Williams Park ponds](#) from May - June. They collected weekly and bi-weekly temperature, dissolved oxygen and chlorophyll data. Monthly, they collected pH, alkalinity, total and dissolved nutrients, and bacteria samples. Our intern through Brown University's IBES program, Yuna Sato, worked to assist volunteers in sampling, coordinate sampling gaps and sampling drop offs at the lab. 2023 data will not be available from URI until spring 2024, but historical data can be view on our [DASHBOARD](#).



TREATMENT TRAIN



The Providence Parks Department and Pare Engineering, through funding from the Rhode Island Infrastructure Bank, have completed engineering designs and selected a contractor for construction of a Treatment Train Project at the inflow to Roosevelt Lake in Roger Williams Park. Construction is scheduled to begin in early 2024. The Treatment Train will filter and treat nutrient and bacteria rich stormwater coming from Mashapaug Pond before it enters Roosevelt Lake. The Train will consist of two box filter systems. The first will contain a Contech Jellyfish filter, then second box will contain biochar. The Stormwater Innovation Center, in collaboration with URI and UNH, will monitor the effectiveness of pollutant reduction of each system under

various maintenance frequencies. In 2023, we began developing a monitoring plan for this project. This site will also be host to workshops and trainings related to Jellyfish filter monitoring. Funding for this monitoring and training will be provided by RIDOT. For more information about the Treatment Train project, you can view a presentation [Recording](#) (Passcode: Ht\$&e0b^) starting at 32:30.

PROFESSIONAL TRAINING

Stormwater Expo, Webinars, Tours, Maintenance Training

STORMWATER EXPO

We continued our successful collaboration with the Green Infrastructure Coalition on the fifth annual [Stormwater Innovation Expo](#) again this year. The keynote speech was delivered by Clara Decerbo the Director of the Providence Emergency Management Agency, which stressed the need for action related to climate change. Nearly 200 stormwater professionals attended this year's event! [Outdoor sessions](#) hosted by the Stormwater Innovation Center were held concurrently with indoor sessions, and were well-attended. Attendees learned about green infrastructure projects within and outside of Roger Williams Park, as well as a variety of water quality and nature-based solution topics, stormwater planning training and stormwater financing.



The full [Expo program](#) and brochure is available for viewing online or can be downloaded. Vendors and sponsors had ample time to network and discuss their equipment and technology with attendees. State and municipal staff registration fees were covered through SIC's partnership with the Rhode Island Department of Transportation.



MAINTENANCE TRAININGS

During the spring of 2023 we coordinated and delivered [3 trainings](#) around inspections, monitoring and maintenance of green infrastructure. In a series of informative trainings, attendees had the opportunity to enhance their understanding of green infrastructure and stormwater management practices through hands-on training.



[The first session](#), held at Roger Williams Park's Botanical Center, focused on Green Infrastructure Maintenance. Led by Botanical Center Director Lee Ann Freitas, participants gained insights into the maintenance procedures employed by Roger Williams Park crews. The session included a practical field exploration within the Park, allowing attendees to address various green infrastructure maintenance challenges and propose effective maintenance plans. Additionally, the training featured a Stormwater 101 presentation delivered by Jen West, the Coastal Training Program Coordinator at the Narragansett Bay Research Reserve.



The second session was titled "[Monitoring and Evaluating Green Infrastructure Function](#)." Conducted by Stormwater Innovation Center Director Ryan Kopp, this training covered low-tech, low-cost methods for assessing green infrastructure function. The importance of long-term assessment of green infrastructure projects is critical for continue water quality improvements. Participants received a brief primer on BMP anatomy to understand the basic components and functions of Best Management Practices (BMPs). The practical component of the session involved inspecting BMPs in the Park and learning to identify signs of suboptimal performance.

The third training session was held at the North Kingstown Town Hall, focused on "[Municipal Stormwater Inspection and Maintenance](#)." Presented by North Kingstown municipal staff, the workshop addressed the requirements of MS4 permits, emphasizing the importance of regular inspection and maintenance of stormwater infrastructure. Joel Rocha, North Kingstown's Stormwater Specialist, provided insights into the Town's approach to inspecting, monitoring, and maintaining stormwater infrastructure. Attendees had the opportunity to visit two sites in North Kingstown, observing these systems up-close and learning from Joel's experience in effectively engaging with Homeowner Associations for stormwater maintenance improvements.



EMERGING TECHNOLOGIES WEBINAR

We coordinated another Emerging Stormwater Technologies in Rhode Island webinar in 2023. We partnered with Rhode Island Department of Environmental Management, Ferguson Waterworks and Convergent Water Technologies to discuss the Focal Point on-line stormwater BMP. Local case studies and experiences using the Focal Point were presented by DiPrete Engineering and Safe Harbor Wickford Cove. The webinar had 215 registrants and 150 live attendees. The recorded webinar is available on [our website](#).



RWP SITE TOURS

Throughout the year, we conduct numerous stormwater management tours and presentations tailored for groups comprising stormwater and public policy professionals. These engagements provide a perfect setting for in-depth conversations, allowing us to delve into the details of what has proven effective, or otherwise, in stormwater management within Roger Williams Park. Furthermore, these discussions serve as valuable forums for exploring successful strategies employed by other organizations in their respective experiences. The exchange of insights, lessons learned, and networking opportunities in areas such as design, construction, and maintenance is pivotal for advancing the collective knowledge base. Among the notable groups we've had the privilege of hosting are the Woonasquatucket River Watershed Council staff, representatives from the Narragansett Bay Estuary Program along with staff from other NEPs throughout the country, RIDEM Water Resources staff, leaders from EPA Region 1, Restore America's Estuaries, The New Bedford Zoo, Audubon Society of Rhode Island Board, the Rhode Island Flood and Mitigation Association, the Buzzards Bay Coalition, as well as leaders from Providence's Mayor Smiley Administration.



UNIVERSITY PARTNERSHIPS

The Stormwater Innovation Center is actively engaged in collaborating with university students and classes, aiming to provide them with valuable insights into the practical aspects of stormwater management and green infrastructure. By sharing lessons learned, design features in green infrastructure, and real-world examples, the SIC contributes to the education of the next generation of engineers, architects, planners, contractors, and maintenance staff. The involvement of these students is crucial, as they represent the future workforce in these fields.

We collaborated with the Johanna Barthmeier-Payne of the Rhode Island School of Design (RISD) to incorporate the park's green infrastructure into their curriculum for 2 different classes. We gave tours and presentations to 2 Hydrologic Systems classes, sharing lessons learned on challenges with design certain features. Students learned about challenges with roadway and inlet grading, the need for construction oversight, erosion issues within a system and designing with maintenance in mind. We also worked with RISD's Sara Cohen and her Materials and Testing: Prototyping and Digital Fabrication class. Students applied their modular unit system near the boat launch and BMP 24 at Cunliff Lake in RWP.



These stacked modular units provide both shoreline stability and respond to the dynamics of the interface of land and water to retain water and soil. The designs demonstrated how their modular systems respond to BMP 24 or the pond edge to create Nature-Based Infrastructure. Their designed systems allow for access to the lake for fishing or passive recreation. We plan to work with Professor Sara Cohen to incorporate some of these innovative materials into a retrofit design for a site in Roger Williams Park. We are deciding between a site where the materials will prevent erosion between an inlet and an existing permeable paver forebay or installing the materials within a newly designed forebay.



We also had the pleasure of working with Jameson Chace and two of his Salve Regina classes. One group was an Environmental Studies class. We toured the park and discussed all of the work being done at the SIC related to stormwater management. The other class was a Natural Resource Management class that we met in Newport. Prior to the class, we provided the students with various literature about the SIC and the projects we are working on. During the class we gave a brief presentation followed by 90 minutes of Q/A. The students were very well prepared, engaged and had lots of questions about stormwater management and green infrastructure.

STORMWATER PLANNING SERIES

We were a part of the SNEP Network's Stormwater Planning Series team again in 2023. We are working with staff from Save the Bay, the SNEP Network, University of New Hampshire Stormwater Center, Narragansett Bay National Estuarine Research Reserve, and the South Eastern Regional Planning and Economic Development District. This series guides Southeast New England communities in developing a conceptual design for a nature-based stormwater retrofit option in their chosen drainage area. Participants utilize the tools and techniques presented in the training to identify cost-effective stormwater solutions tailored to their specific location. The virtual planning series spans six months with five training sessions, encouraging communities to assemble interdisciplinary teams comprising municipal/tribal staff, board members, and community members. [One field visit](#) is also made to each communities selected location. This collaborative approach aims to foster a shared understanding of stormwater management options aligned with the community's culture and maintenance capacity.



STORMWATER MANAGEMENT PLANNING, DESIGN, CONSTRUCTION

BMP IMPROVEMENTS - REPAIRS

Over the past 4 years, our [research](#), [monitoring](#), inspection and assessment of BMPs in Roger Williams Park has identified many sites that aren't functioning as intended. Challenges with planning, design, construction oversight, maintenance and the general degradation of a site over time all contribute to these less than ideal conditions for treating stormwater and improving water quality.



Through funding from a Restore America’s Estuaries grant and match from the City of Providence Parks Department, we selected 7 sites to make improvements and repairs. Roadway grading, inlet grading and design type, system erosion, deposition and compaction are all components that will be improved with new design and construction. Kleinfelder provided design work for BMP 17/18 with the rest of the design and survey work being done by the Providence Parks Department. We are also working with RISD professors to test innovative materials and modular forms within these designs. Designs are complete, the project will go out for contractor bid in 2024.

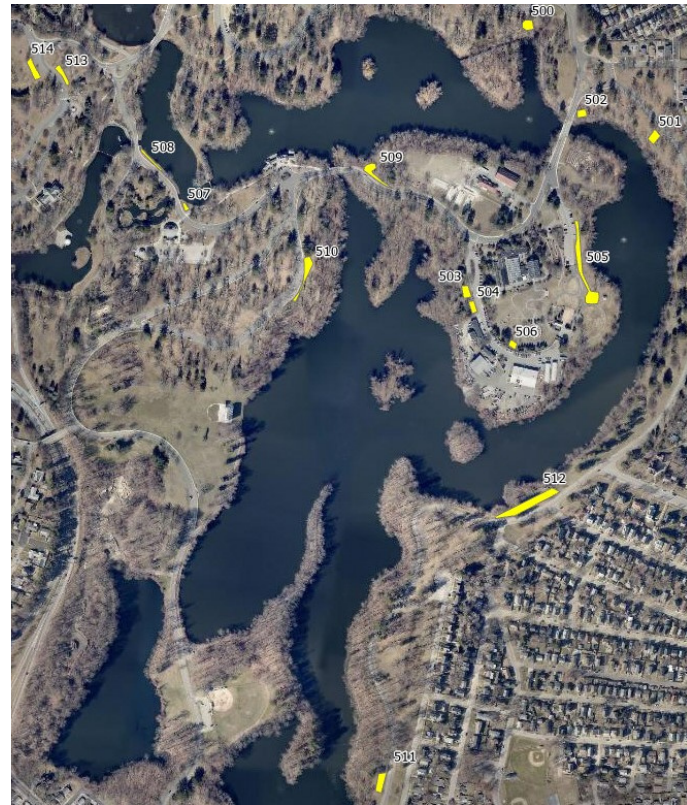
NAME	LOCATION	IMPROVEMENT
BMP 17/18	Polo Lake	Improve inlet and excess deposition in forebay
BMP 34	Botanical Center/Community Garden	Improve lower inlet to allow faster flow, prevent flooding, repair erosion
BMP 1C	In front of Boathouse	Improve inlet to increase flow, repair erosion between inlet and forebay.
BMP 1E	Maple Ave	Increase elevation of overflow berm, repair erosion between inlet and forebay
BMP 1F	Boathouse Intersection	Improve inlet to convey flow into upper forebay.
BMP 3B	Carousel	Improve inlet and repair excess forebay deposition
BMP 37B	Behind Natural History Museum	Increase elevation of overflow berm, contain excess volume

Through funding from a Narragansett Bay Estuary Program grant and match from the City of Providence Parks Department and Save the Bay, four different sites have been selected for improvements. Only design work for this project is currently funded. In 2024 we will develop a scope of work and RFP for this project to be put out to bid.

NAME	LOCATION	IMPROVEMENT
BMP 28	Edgewood Ave	Roadway grade improvement, Inlet improvement - some flow currently bypassing
BMP 19A	Zoo Entrance	Divert water from both sides of the roadway into system. Improve lower inlet
BMP 2	Across from Carousel	Improve inlet - flow currently bypassing
BMP 1B	Thinking Man Statue	Improve inlets and add riser to overflow to increase storage/treatment volume

BMP PLANNING

The City of Providence Public Works Department has hired VHB Consulting to develop a TMDL Implementation Plan for 4 watersheds in Providence. One of the watersheds includes Roger Williams Park. This plan is identifying the remaining stormwater outfalls in the park that contribute stormwater runoff directly to the Roger Williams Park Ponds and proposing locations for more green infrastructure to be designed and implemented. We conducted site visits of the 14 proposed locations and provided feedback to the City and VHB. There is also potential overlap with some of the design and construction work being done through our NBEP and RAE projects. This is exciting news that 14 more proposed outfalls could be taken offline to reduce runoff into the ponds and we look forward to collaborating and supporting the Public Works Department on their project.



RWP ZOO STORMWATER MASTER PLAN

In October 2023, we were awarded a grant to partner with the Roger Williams Park Zoo, The City of Providence Public Works Department, URI and the Providence Parks Department to mitigate cyanobacteria blooms, promote education and outreach, and establish a comprehensive stormwater management approach for the Zoo. A Stormwater Master Plan will identify, prioritize and propose nutrient reduction strategies to reduce blooms in the RWP Zoo wetland, and the downstream ponds of RWP.

Outreach and educational materials will be developed with zoo staff and used in youth programs and signage. Progress will be showcased at the Stormwater Innovation Expo, and a webinar will target national zoo staff, sharing the master plan, implementation strategies, and lessons learned. Baseline data on water quality and quantity will be collected to assess the plan's future effectiveness.



PUBLIC OUTREACH-ENGAGEMENT

Festival, School Programs, Tours, Signage, Media

RAIN HARVEST FESTIVAL

Despite facing unexpected challenges with heavy rainfall and lower-than-expected turnout, the [Rain Harvest Festival](#) in 2023 remained a positive and enlightening experience for attendees. Our expanded promotional efforts, professional outreach materials, and an impressive lineup of environmental educators, entertainment, and food showcased our commitment to fostering environmental awareness and community building. Environmental education demonstrations were from Northern Rhode Island Conservation District, Save the Bay, Woonasquatucket River Watershed Council, Audubon Society of Rhode Island, US Fish and Wildlife, Narragansett Bay Commission, Groundwork-RI, URI Watershed Watch, The Nature Conservancy, 15-minute Field Trips, Coastal Institute, Dwell Labs, and RI Resource Recovery.



Lively, creative and [engaging entertainment](#) was provided by Sussy Santana, ERB Band, Rhode Island Black Storytellers, Alpaca Lunch and Art on the Spot face painting. Despite the weather, the approximately 150 people that attended the festival were glowing with smiles and [engaged in learning](#) about diverse [environmental topics](#) and ongoing projects in Rhode Island aimed at enhancing water quality.



CYANOBACTERIA SIGNAGE

The Rhode Island Department of Health has created informative new cyanobacteria signage designed for statewide use. These signs not only offer educational content, presenting facts about the causes and dangers associated with cyanobacteria, but also feature photographs to aid in the identification of cyanobacteria blooms. Taking an active role in this initiative, we have procured the signs and facilitated their delivery to the Parks Department. Our next step involves collaborating to ensure the timely installation of these signs throughout Roger Williams Park, contributing to heightened public awareness and environmental education. The Stormwater Innovation Center can also serve as facilitators to get signage distributed to other communities that have waterbodies that have frequent cyanobacteria blooms.

THIS WATER HAS A HISTORY OF CYANOBACTERIA (BLUE-GREEN ALGAE) BLOOMS

NOTICE!

If the water looks like thick pea soup and foam (Fig. A & B), looks cloudy with a green tint (Fig. C), or like spilled paint (Fig. D), it may be a blue-green algae bloom.

Figure A. Blue-green algae may make the water look like pea soup

Figure B. Thick green foam may wash ashore during a bloom

Figure C. Blue-green algae may make the water look cloudy with a green tint

Figure D. Film on surface of water can look like spilled paint

Health risks for you or your pets include:

- Rashes, blisters, and hives
- Eye and nose irritations
- Abdominal pain, diarrhea, or vomiting
- Numb lips, tingling in fingers and toes, and dizziness

High exposure (e.g., dogs drinking the water) may cause difficulty breathing, convulsions, and death.

Call your doctor or veterinarian if you or your animals have a sudden, unexplained illness or rash.

For more information about cyanobacteria or to report an observation:
<http://www.dem.ri.gov/bluegreen> or DEM.OWRCyano@dem.ri.gov

Rhode Island Department of Health
Health Information Line:
401-222-5960 / RI Relay 711

STORMWATER IN SCHOOLS

Our [Stormwater In Schools](#) initiative achieved resounding success once again this year. Collaborating with four schools in the Providence metro area—[Paul Cuffee](#), Sophia Academy, New Urban Arts, and [Eden Park](#)—we provided students with engaging, in-person educational experiences facilitated by the Stormwater Innovation Center. These sessions delved into crucial topics such as watersheds, pollution sources, and the role of stormwater in transporting contaminants to rivers, lakes, and the ocean.

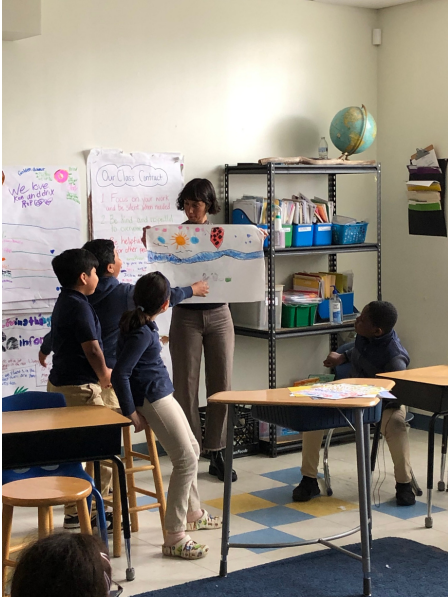


To complement classroom learning, we organized hands-on tours to Roger Williams Park, where students discovered the benefits of green infrastructure as a viable stormwater management solution to mitigate pollution entering our waterways. We also partnered with four teaching artists who utilized art as a powerful medium for conveying environmental messages. Generously supported by Coca Cola Northeast, we sourced [20 fifty-gallon barrels](#), that were repurposed into rain barrels through the purchase of retrofit kits.



STORMWATER IN SCHOOLS

Under the guidance of teaching artists, students developed captivating stormwater-themed designs that decorated the rain barrels, giving them a vibrant and unique appearance. These barrels were then installed at each school, featured in a raffle during our Rain Harvest Festival, or found homes with families interested in using sustainable practices. To celebrate the students' achievements, we organized [recognition ceremonies](#) at each school, showcasing the impressive designs and [rain barrels](#). These events highlighted the valuable lessons learned about capturing stormwater roof runoff and encouraging its infiltration into soils rather than contributing to runoff into our precious water bodies.



STORMWATER PSA VIDEO

In 2023, the Stormwater Innovation Center partnered with Steer Forward Media to craft an innovative [public service announcement video](#) aimed at raising awareness about the impact of stormwater on water quality. Traditional environmental education videos often suffer from being overly factual and preachy, potentially alienating the very audience we aim to engage. Our unique approach to this PSA involves using a light-hearted and humorous tone to resonate with a broader audience, particularly those who may not consider themselves environmentalists.



We've introduced a villainous and unlikeable character, "Stormwater," as the focal point of our narrative, hoping to make the information more relatable. The success of this initiative could pave the way for the integration of the "Stormwater" character in future creative videos. Our collaboration with Steer Forward Media ensures broad distribution across both television and social media platforms, maximizing our impact and outreach. The video concludes with a call to action, urging viewers to visit our [new webpage](#). Here, we guide individuals on minimizing stormwater runoff and pollution from their property, offering practical tips for successful implementation.



SELF-GUIDED TOURS

We completed Phase II of our outreach project at the Seal House in Roger Williams Park in 2023. Phase II created a green infrastructure and [stormwater newspaper](#) that park visitors can use to take a self-guided tour to 5 stops along a 1 mile walking tour to learn about each site and the restoration work being done in the park. The stops include infiltration basins, buffer plantings, the Treatment Train, bio-retention basins and pavement removal sites. The brochure was beautifully designed by Jose Menendez, a Northeastern University graphic design professor. To go with the newspaper, he refurbished, painted and designed an old [newspaper box](#) that the newspapers sit in outside of the Seal Souse. The design theme of the newspaper and newspaper box, matches the phase I design of the educational displays outside of the Seal house. Phase III, is already underway, working with Dwell Labs and URI Professor Madison Jones to add augmented reality at each tour spot as a unique and innovative method of story-telling and education.



RAIN BARREL WORKSHOPS



In 2023, our initiatives included rain barrel workshops aimed at educating community members on the effective installation of barrels at their homes. Notably, Lincoln School student Ainsley volunteered her talents to artistically paint several barrels, transforming them into unique pieces that were later auctioned off. Audubon Society of Rhode Island's [Youth Conservation League](#) prepared, retrofitted, and painted barrels with vibrant designs, contributing to a collection of barrels distributed within the community. We also delivered a rain barrel presentation at the Garden Stroll put on by the West Broadway Neighborhood Association.

SIC T-SHIRTS

Our talented IBES intern, Yuna Sato, conceived an impressive T-shirt design that we brought to life through printing. Presently, we provide these distinctive T-shirts as tokens of appreciation to volunteers and partners who contribute to our events or programs. Looking ahead to the coming year, we aim to establish an e-commerce platform on our webpage. This platform will showcase and sell a range of items, including the Stormwater Innovation Center T-shirts, additional merchandise, and retrofitted painted rain barrels. The proceeds generated from these sales will be used to sustaining and advancing our educational and outreach program development efforts.



FLOATING WETLAND



The design and implementation of floating wetlands has generated quite the buzz in Rhode Island this year. Floating wetlands come in a variety of designs and function and are constructed to improve water quality by reducing nutrients and bacteria but also can be used to develop educational programs around that highlights the importance of conserving and restoring natural wetlands within an ecosystem to reduce flooding and improve water quality. We have had 3 requests for different groups about implementing floating wetlands in Roger Williams Park. A group from Hamilton University, the [Below and Above Collective](#) and a RISD led BioPod group all have unique and interesting takes on floating wetlands. We hope to get at least one of these wetlands permitted for installation in the park and incorporated into our education and outreach programs.

A LOOK AHEAD

Future plans and strategies

As we look ahead to 2024, we are excited about the growth opportunities that await the Stormwater Innovation Center. Our focus remains on continuing research and monitoring of stormwater systems, emphasizing their effectiveness. We are committed to providing place-based learning programs for stormwater professionals, with a specific focus on green infrastructure maintenance and inspections. Additionally, we aim to creatively engage students, volunteers, and the community to raise awareness about the stormwater and water quality challenges faced in Rhode Island. We are also actively collaborating with municipalities and local organizations to assist in planning, funding, designing, implementing, and restoring local stormwater and green infrastructure projects.

MONITORING

- Watershed Watch, Rain Snap, and Cyanobacteria Monitoring: Engage volunteers, provide data for stakeholders, decision makers related to stormwater management.
- Rain Snap Expansion: 2023 successful pilot in Providence Metro; expanding through partnerships to other regions.
- BMP and Green Infrastructure Monitoring: Shifting focus to monitoring sediment deposition in treatment areas, infiltration rates and stormwater outfalls.
- Treatment Train Monitoring: Upcoming initiative to assess treatment technology effectiveness in real-world settings under various maintenance conditions.

PROFESSIONAL TRAINING

We are excited to grow the Stormwater Innovation Center as a platform for learning. We will continue to work with private and public sector organizations to deliver place-based green infrastructure maintenance trainings hosted in Roger Williams Park and in other communities as well. We will continue to highlight maintenance processes and techniques being done by other organizations on a wide variety of green infrastructure sites around Rhode Island.

- Presentations, Workshops and Training: Ongoing partnerships with experts for Stormwater Innovation Center presentations and workshops. Plans to expand the Expo to multiple locations in RWP for increased attendance and diverse green infrastructure presentations.
- Emerging Stormwater Technologies Webinars: Continuing webinars in collaboration with RIDEM and private companies. Focus on newly approved stormwater technologies.
- University Collaboration and Student Involvement: Incorporating classroom projects into real-life examples in Roger Williams Park to enhance students' practical skills before entering

COMMUNITY OUTREACH - ENGAGEMENT

- Rain Harvest Festival Collaboration: Partnering with Roger Williams Park. Event relocates near the Botanical Center.
- Stormwater in Schools Program: Continuing collaboration with three schools: Sophia Academy, Eden Park, and New Urban Arts. Introducing a new twist with students designing pollinator boxes featuring green roofs. Recognition ceremony with professionals from stormwater and green building communities providing feedback.
- EPA Education Grant Proposal: Submitted a proposal at the end of 2023. Utilizing Roger Williams Park ponds, green infrastructure, and Stormwater Innovation Center for real-world education.
- Proposed Project Coordinator to work with sub-awardees for curriculum and outreach programs targeting disadvantaged communities. Sub-awardees include Building Futures, Movement Education Outdoors, Woonasquatucket River Watershed Council, Below and Above Collective, and Providence Parks Urban Wildlife Partnership.
- Collaborate with the City of Providence on Earth Month programming. Deliver content about stormwater to residents and students. Coordinate rain barrel workshops, student stormwater mural painting in RWP.

STORMWATER MANAGEMENT PLANNING, DESIGN, CONSTRUCTION

The Stormwater Innovation Center (SIC) remains committed to utilizing the existing Best Management Practices (BMPs) in Roger Williams Park (RWP) as a hub for place-based learning, research, and outreach. Concurrently, the RWP ponds continue to serve as an active restoration site. Our ongoing collaboration with partners involves planning, designing, and implementing stormwater management solutions to enhance water quality within the park ponds. Looking ahead, we are eager to create partnerships with communities and organizations across Rhode Island to extend the reach of our stormwater management initiatives.

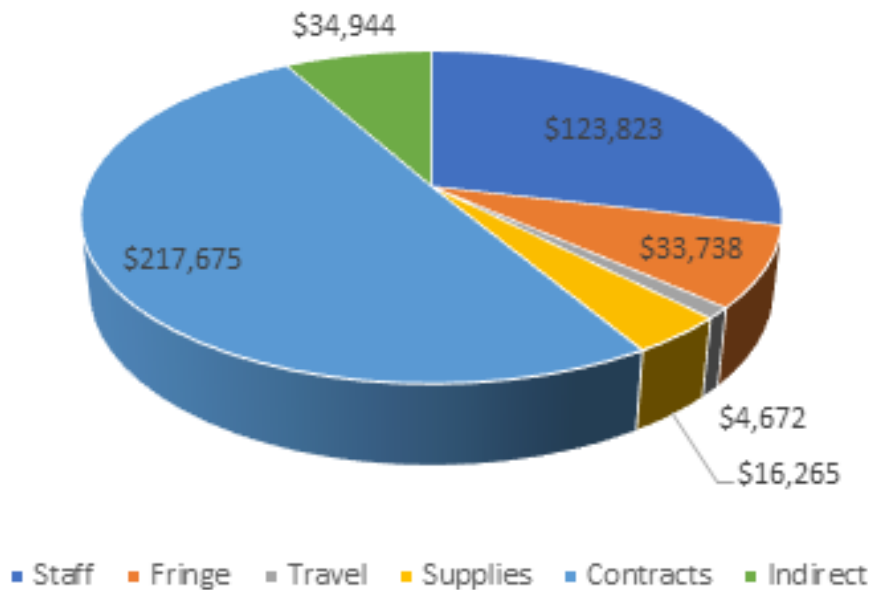
- Zoo Stormwater Master Plan: Collaborating with Roger Williams Park Zoo, Providence Parks Department, URI, and Department of Public Works. Developing a comprehensive Stormwater Master Plan for the zoo, including training zoo education staff. Sharing insights through a webinar for regional zoo staff.
- RAE Retrofits in RWP: Completing green infrastructure retrofits and repairs. Coordinating trainings and tours to showcase changes and evaluate successes or failures.
- NBEP Retrofit Project: Issuing an RFP to hire a consultant for retrofit designs at four underperforming sites. Share lessons learned.
- [NSF EPSCoR Track 2](#) Grant Proposal: URI, RISD, and UNH submit a proposal, aiming to engage community stakeholders through augmented reality in green infrastructure design decision-making processes. Choosing a site in Roger Williams Park to include in their project

FUNDING AND FINANCIALS

NEW FUNDING IN 2023

Restore America's Estuaries - Zoo Master Plan – \$197,348
Narragansett Bay Estuary Program – Retrofit/Repair Designs in RWP - \$70,000
Rhode Island DOT Agreement – Outreach, Education and Innovation - \$150,000
SNEP Network – Technical Assistance – \$13,860

2023 Funding Amounts By Category



Stormwater Innovation Center Funding By Year

